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Variation of vapour pressure with height - L P Smith

The mean vapour pressure at the four main synoptic hours at three stations in the northwest, Carlisle, Eskdalemuir and Great DunFell were analysed over the years 1966 - 1970, on a monthly basis. Using the 5 year means the relationship between the vapour pressure ratio (E/E_o) and height was almost linear although a slightly better fit was obtained using the logarithm of this ratio, where

E_o = mean vapour pressure Carlisle.

E = mean vapour pressure at other two stations.

H = height difference in 100s of feet.

The results were:-

		Correlation Coefficient
January $\frac{100E}{E_o}$ =	99.01 - 0.757H	-0.9937
February	98.57 - 0.754H	-0.9869
March	98.33 - 0.753H	-0.9799
April	98.36 - 0.750H	-0.9825
May	98.66 - 0.745H	-0.9880
June	98.68 - 0.737H	-0.9883
July	98.61 - 0.729H	-0.9866
August	98.68 - 0.725H	-0.9878
September	98.33 - 0.719H	-0.9804
October	98.49 - 0.742H	-0.9849
November	98.49 - 0.758H	-0.9855
December	98.86 - 0.758H	-0.9916
January $\log \left(\frac{100E}{E_o}\right)$	1.9999 - 0.00372H	-0.9965
February	1.9978 - 0.00371H	-0.9914
March	1.9961 - 0.00371H	-0.9860
April	1.9967 - 0.00369H	-0.9880
May	1.9981 - 0.00366H	-0.9924
June	1.9981 - 0.00361H	-0.9924
July	1.9978 - 0.00357H	-0.9913
August	1.9980 - 0.00355H	-0.9920
September	1.9964 - 0.00352H	-0.9861
October	1.9974 - 0.00365H	-0.9900
November	1.9974 - 0.00374H	-0.9905

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		Correlation Coefficient
December	1.9992 - 0.00373H	-0.9951

In both cases the smooth seasonal variation of the height coefficient seems significant.

Any comments or suggestions on this paper should be referred to the author.

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